AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning on page 5, line 24 with the following paragraph:

In another embodiment, the invention involves a system for cooling and monitoring tissue and includes ~~a probe~~ a probe, a source, a pump, a first temperature sensor, and a second temperature sensor. The probe is adapted to be inserted into tissue and, [[and ,]] includes first and second concentric channels. The first and second concentric channels each have an inlet and an outlet. The source of working fluid is in fluid communication with the first and second concentric channels. The pump is operatively associated with the source and probe. The first temperature sensor is mounted to the probe and adapted to monitor the temperature of the tissue engaging the probe. The second temperature sensor is mounted radially from the probe and is adapted to monitor the temperature of the tissue engaging second temperature sensor.

Please replace the paragraph beginning on page 12, line 7 with the following paragraph:

In one embodiment, probe 10 of **FIG. 1** operates as follows. Cooling (or heating) fluid from a source, described in relation to FIGS. 2 and 3, is transported through an inlet 32 into inner channel defined by inner tube 12 [[14]]. The working fluid acts to cool (or heat) tissue, or another sample, adjacent probe 10. In one embodiment, the tissue may be brain tissue that has undergone trauma, and the cooling may both reduce swelling and dissipate heat. The working fluid exits opening 16 and enters an outer channel defined by outer tube 14. From there, the working fluid may be transported back to the source. Using first temperature sensor 20, a first temperature of tissue (or other sample) is sensed at a first location. Using second temperature sensor 22, a second temperature of the tissue (or other sample) is sensed at a second location. The distance and/or relative orientation between the first and second positions may be known so as to allow one to calculate a host of thermal properties of the tissue (or other sample) according to equations known in the art according to the known boundary conditions. In one embodiment, a thermal property may be keyed to the relative health of a tissue sample. For instance, a thermal property may indicate whether the tissue is alive, dead, or the proximity to either of these two extremes. The keying of thermal properties to health may be done via a lookup table or the like generated by studying the thermal properties of samples of known health.

Please replace the paragraph beginning on page 14, line 21 with the following paragraph:

System 71 of **FIG. 3** shares several elements with the system shown in **FIG. 2**, and the description given for **FIG. 2** therefore applies. **FIG. 3** additionally shows a probe holder 72 coupled to outer tube 14. Probe holder 72 may facilitate holding the probe during use and can be designed ergonomically as desired. Dashed line 57 illustrates that first temperature sensor 20 may be linked via wires, wirelessly, networked, or the like through an optional controller (not shown in **FIG. 3**) to, for example, source 44 (here, shown as a chiller), pump 42, or other equipment. In one embodiment, dashed line 57 may also extend to pressure gauge 82. System 71 includes pressure gauge 82 and valves 74, 76, 78, 80, and 86, which assist in flow management of fluid into and out of probe 10. ~~control.~~ In one embodiment, valves 86, 78, 76, and 74 may be ball valves commercially available from SWAGELOK INSTRUMENTS, although other valves may be used as well. In one embodiment, valve 80 may be a commercially available NUPRO S SERIES metering valve. ~~limited~~ Arrow 88 indicates nitrogen/air in, and arrow 90 indicates pressure relief. Element 84 indicates a cooling liquid interface chamber with a pressurization gap that can be used to set the pressure of the circulating coolant, which may be important if the coolant is a refrigerant.

Please replace the paragraph beginning on page 26, line 11 with the following paragraph:

FIG. 15 shows the measured temperature data from the remote thermocouple (see, e.g., second temperature sensor 22 in the figures) for a dead brain test, where there is no perfusion or metabolism, and the predicted response for several values of guessed tissue thermal conductivity. A value of thermal conductivity of about 0.75 [[w/m-C]] w/m-°C is found to yield a good prediction. The data as previously discussed is only analyzed in the first minute or so to get the brain tissue thermal characteristics. The literature reports scattered values of k in the range 0.4 to 0.85 [[w/m-C]] w/m-°C for several different types of tissue.

Please replace the paragraph beginning on page 27, line 14 with the following paragraph:

2) For both the perfused and non perfused brain, a significant volume of brain tissue out to the remote thermocouple and certainly to ~~lessor~~ lesser amount beyond the 7.8 mm radius, tissue temperature was seen to drop 3°C and 9°C respectively on the order of 10 minutes. All

brain tissue locations closer to the cooling probe than the remote thermocouple were at temperature between the remote thermocouple and the wall temperature of 5°C. There is significant cooling locally around the probe and this has therapeutic hypothermia value in reducing tissue swelling and cell death.

Please replace the paragraph beginning on page 27, line 22 with the following paragraph:

3) The data from the perfused alive case when compared with dead brain data is important to an understanding of brain cooling and relating thermal behavior to the diagnostics of the health of brain tissue. For the perfused case, the remote temperature dropped quickly 3°C and after a few minutes achieved steady state. This results from the fact that blood perfusion into the cooling zone and brain heat generation from metabolism are offsetting the cooling from the probe, and, locally, a state of equilibrium is reached. Because there is such a big difference between the two cases (perfused vs. non perfused), modeling can be used to quantify and separate out the impact of the phenomena on local cooling. Furthermore, because the thermal response of brain tissue is so drastically different for alive and dead ~~brain~~ brains, one may use the cooling probe not only for therapeutic hypothermia, but also for a host of diagnostic tools for quantifying the progression or growth of brain tissue death or reduced perfusion, among other things. For example, if the cooling probe when initially imbedded into a suspect brain zone suffering from ~~stoke~~ stroke or trauma damage shows only a 3°C drop in temperature of the brain tissue, but several hours later under the same probe cooling conditions shows a larger drop in remote tissue temperature, one can infer that locally more tissue has died as a result of reduced perfusion and metabolism in the region of interest.